Transforming Marine Corps C4I from the Ground Up

Marine Corps Systems Command
POM-06 Strategic Plan

July 2003

Bottom Line up Front

- ***Network Centric Warfare: All Joint and Service C4I transformation strategies (Future Combat System (FCS), ForceNet, WIN-T, etc.) call for a integrated data networking environment. In the Marine Corps:***
  - ***There is only limited funding available to transform the maneuver elements' C4 until after FY2010***
  - ***Current experimentation demonstrates we can bridge the "Digital Divide" between the Maneuver Elements and their MSCs now by enabling digital access to the data from the bottom up.***
  - ***POM-06 enables the Marine Corps to use JTRS, FICCS, and STOM Bridge to enable the Transformation Plan.***

Capability Shortfalls

- ***In all conflicts since the introduction of tactical data networking the following has applied:***
  - ***<u>The Digital Divide</u> - Major Subordinate Commands are provided sufficient capacity while data access by Maneuver Element Commands is limited.***
  - ***<u>Tactical Networking</u> –***
    - ***Not all Units have data access***
    - ***Maneuver Elements are dependent on Line of Sight Radios.***
    - ***No On The Move (OTM) Over The Horizon (OTH) capability***
  - ***<u>No New Radios</u> - Most units have access to ONLY the following waveforms:***
    - ***SINCGARS, HaveQuick II, HF ALE, EPLRS, TACSAT***

    JTRS will add WNW, but not in sufficient number until 2010 and beyond.
  - ***<u>C4 Procurements</u> - Traditionally focused on filling out an Architecture should be refocused on system development to support a Capability.***

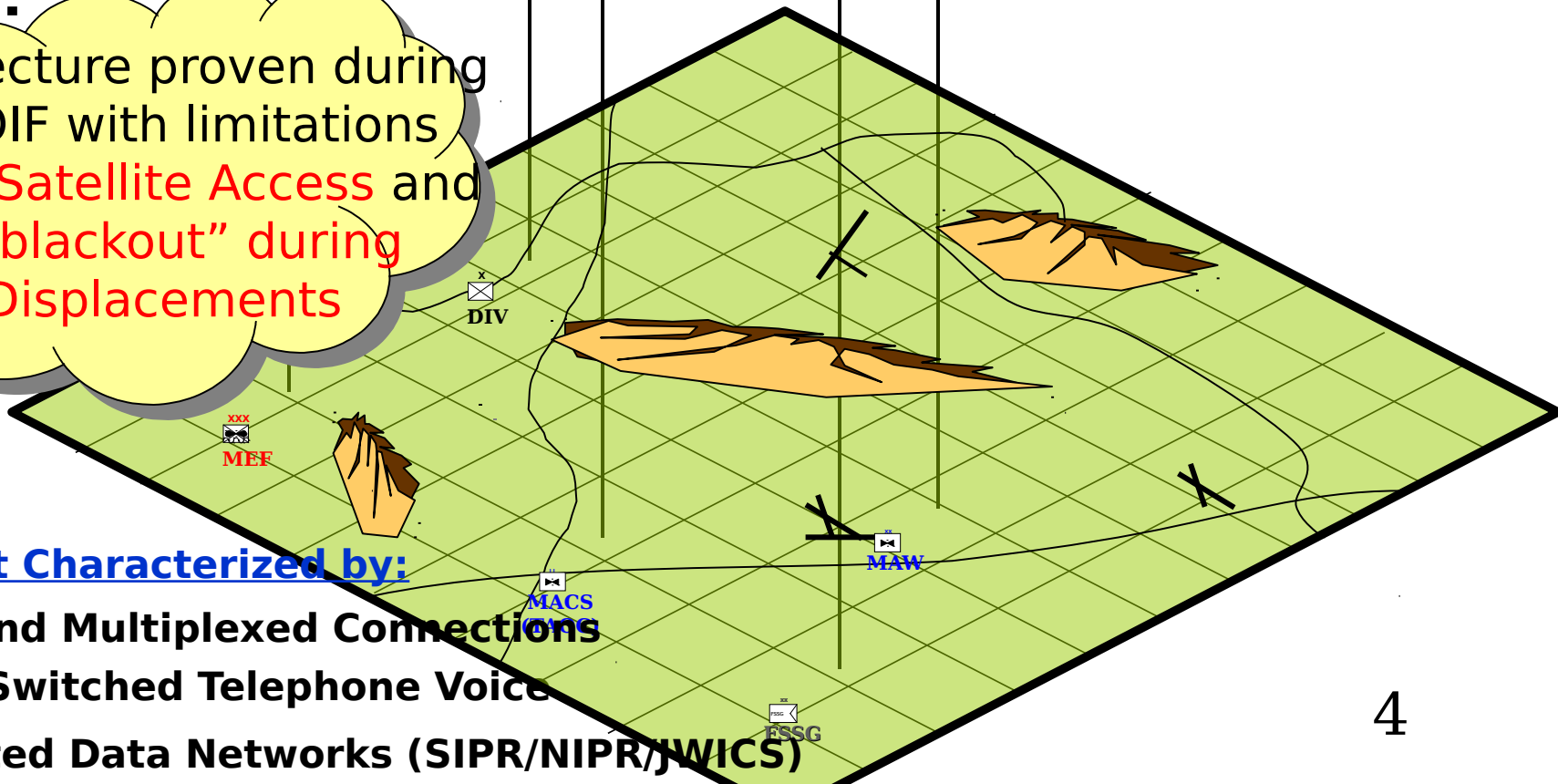
How do we provide Tactical Networking to all without the expense of new infrastructure?

Marine Corps Architecture:

Major Subordinate Commands (MSC)

LMST
SMART-T
GMF
Trojan Spirit
Commercial SatComm
TRC-170
MRC-142

Architecture proven during DS/OIF with limitations being Satellite Access and "C² blackout" during Displacements



MSC Net Characterized by:

Broadband Multiplexed Connections

Circuit Switched Telephone Voice

- **IP Routed Data Networks (SIPR/NIPR/JWICS)**

Marine Corps Architecture: Maneuver Element Commands

MEF DIV FSSG MAW

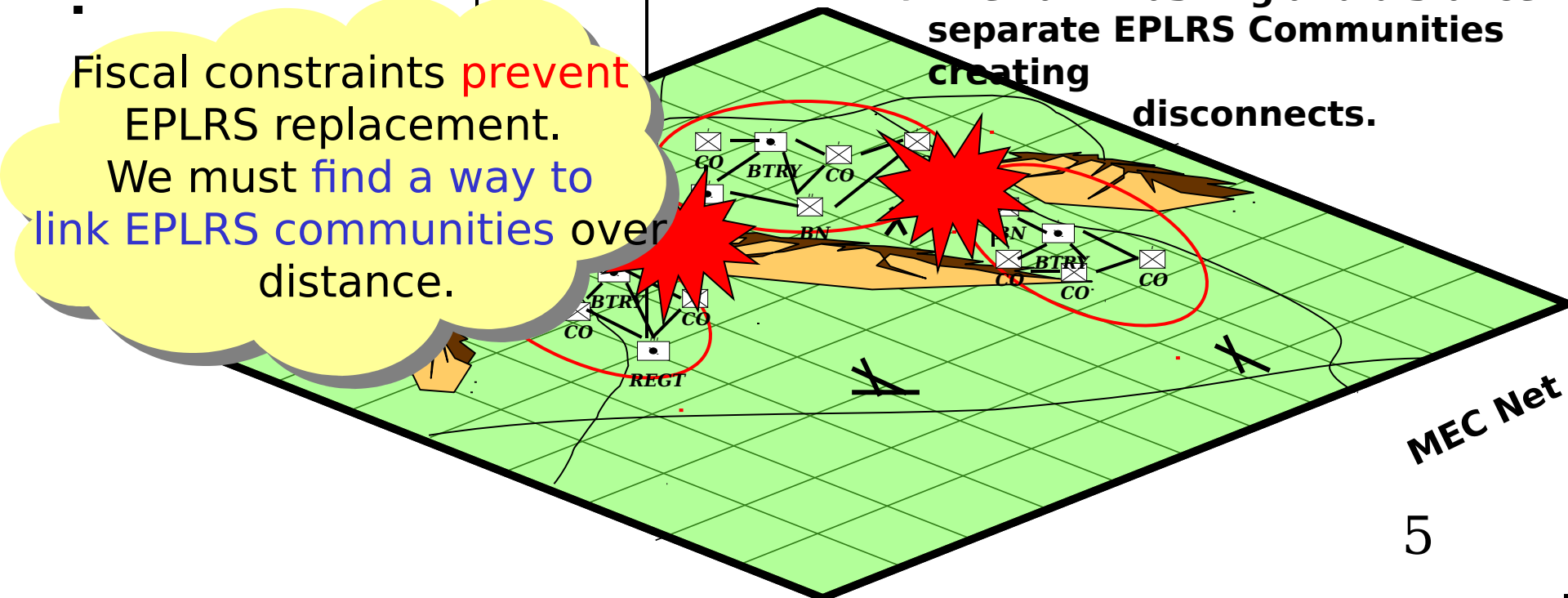
LMST
SMART-T
GMF
Trojan Spirit
Commercial SatComm
TRC-170
MRC-142

MSC Net

- Regiments have only connection to MSC Net

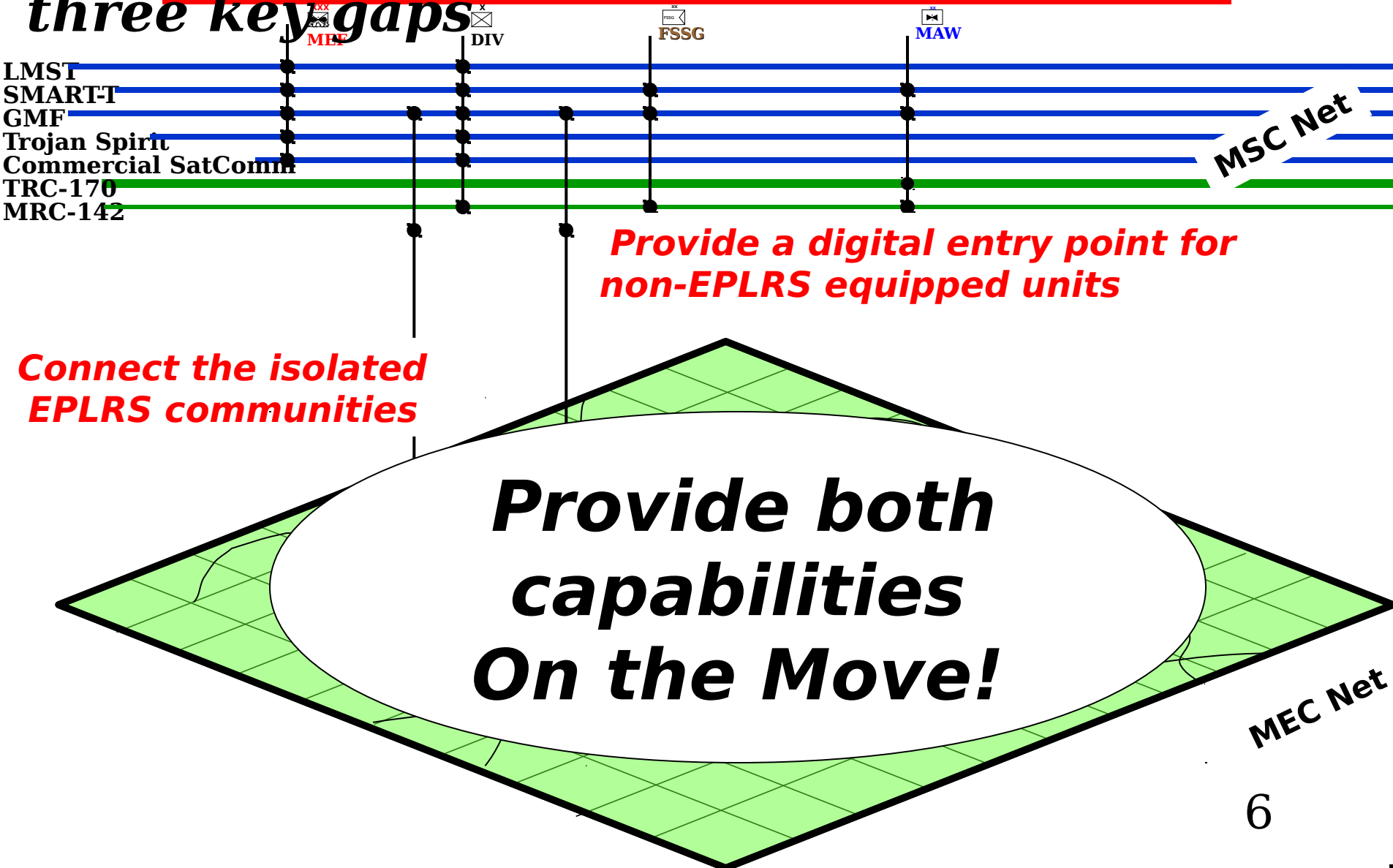
- Data is pushed to Tactical Units with EPLRS creating local communities of connectivity
- Terrain masking and distance separate EPLRS Communities creating disconnects.

Fiscal constraints prevent EPLRS replacement. We must find a way to link EPLRS communities over distance.

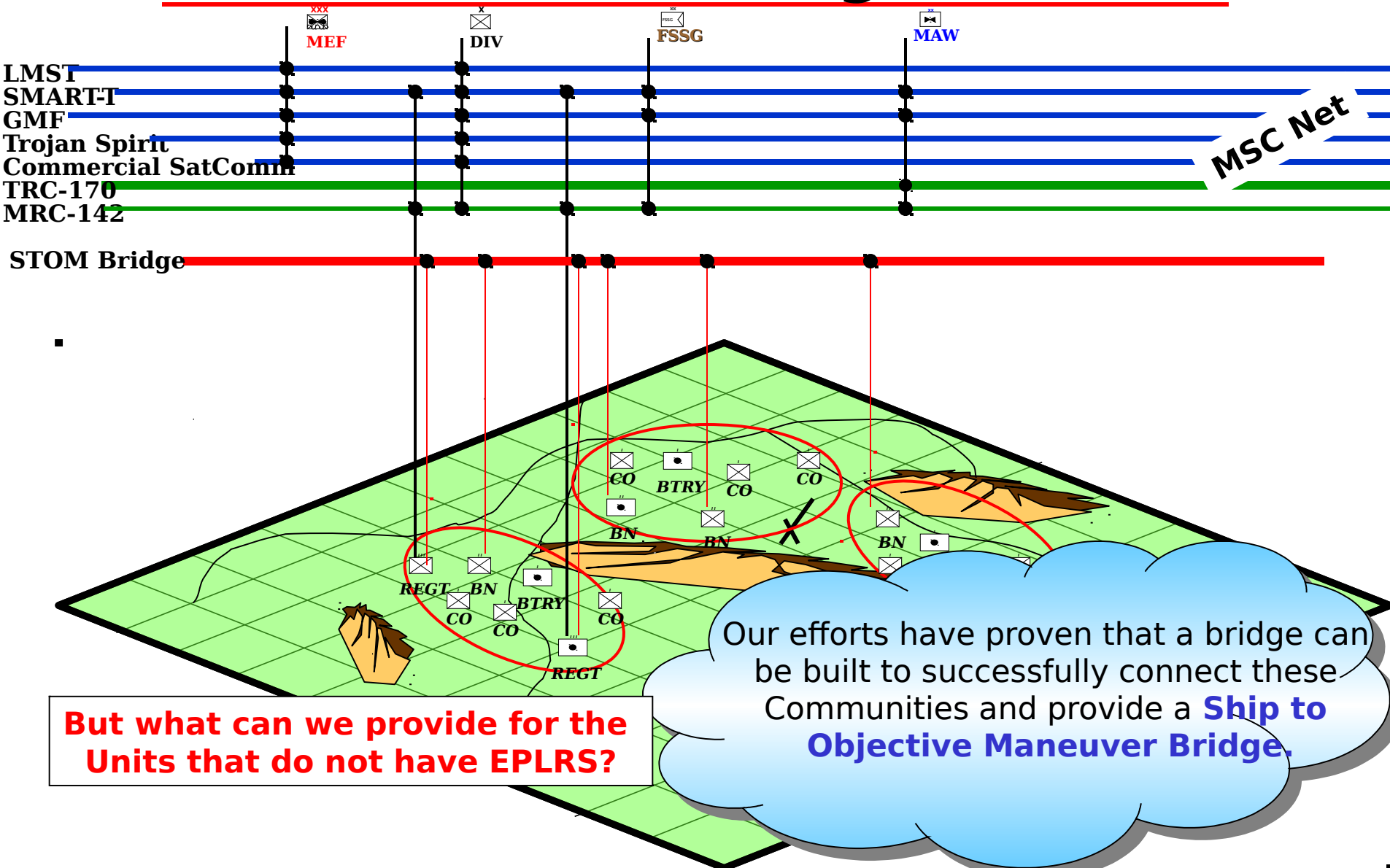


MEC Net

A Ship to Objective Maneuver (STOM) Bridge needs to fills three key gaps



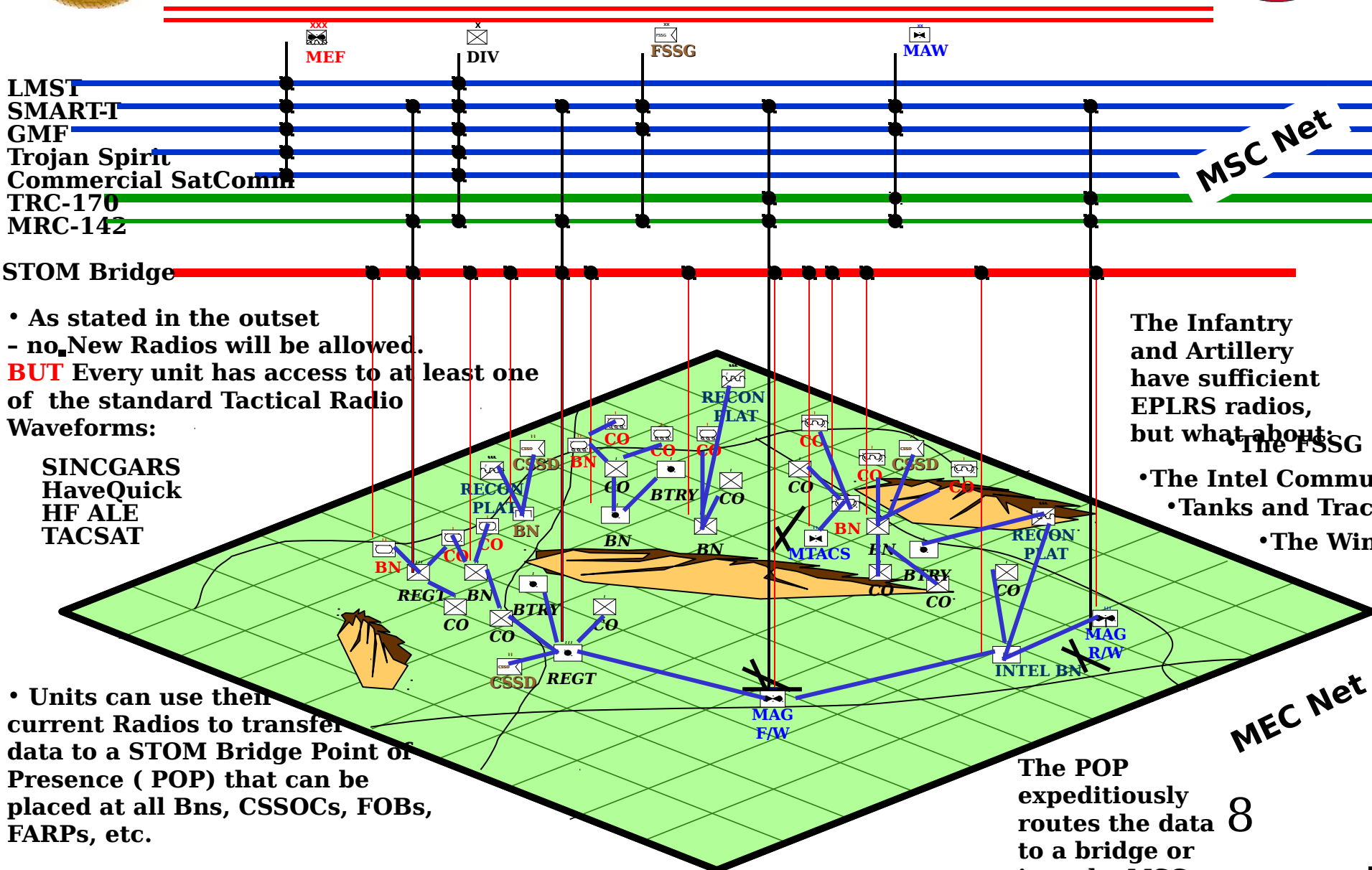
Connecting Through The STOM Bridge



But what can we provide for the Units that do not have EPLRS?

Our efforts have proven that a bridge can be built to successfully connect these Communities and provide a **Ship to Objective Maneuver Bridge.**

Extending the Bridge



• As stated in the outset – no New Radios will be allowed.

BUT Every unit has access to at least one of the standard Tactical Radio Waveforms:

- SINCGARS
- HaveQuick
- HF ALE
- TACSAT

• Units can use their current Radios to transfer data to a STOM Bridge Point of Presence (POP) that can be placed at all Bns, CSSOCs, FOBs, FARPs, etc.

The Infantry and Artillery have sufficient EPLRS radios, but what about:

- The FSSG
- The Intel Commu
- Tanks and Trac
- The Win

The POP expeditiously routes the data to a bridge or

C² Mobility

STOM bridge connects EPLRS Communities

STOM Bridge POP Extends Connectivity

What can we do for Mobile C² during Displaceme

- **SA was degraded for up to 26 Hours at the MEF and Division HQ during these times**.
  - Shutting down Satellite and Terrestrial MUX caused Server/Track Database de-synchronization.
  - Commanders used Satellite voice or single channel systems to Command.
  - Staff was unable to update changes in COP.

Recommended approach is to add a STOM Bridge Jump C² Var

- HMMWV Mounted OTM/OTH JECCS Capability
- Current Commercially available systems provide 64 Kbps OTM/
- Future OTM/OTH military systems will enhance capability.
- The Joint Expeditionary Tools Set (JETS) provides SIPR/NIPR Se

- **Jump C² Variant Maintains state on Servers and Track Databases during displacements.**
- **Commander and Staff access via Wireless Lan Technology.**

Architectural Changes

- Building this structure requires a change in our C4 architecture from a "top down" Hierarchical network to a more **"ground up" distributed (peer to peer) design**.
  - Make the network like an "AOL Dial-up"
  - Build the network to receive data on waveforms that the Marines at the lower echelons have.
  - Make the Routers in the Bridge and POP move information out of the bandwidth limited MEC Net if not needed.
  - Use Transformational Period (2003-2010) to develop TTP and IP Management structures.

Transforming C⁴ from the Ground Up

Transformational Communications Architecture – ForceNet
Wideband Way Ahead –Joint Terrestrial Mux

Core Network Ser…

Network Centric Enterprise Systems

…cks

…sets

Capability Sets

Enabler:

STOM Bridge:	**OTM/OTH Tactical Communications Bridge** **Point of Presence for ANY JTRS Waveform** **Mobile C² Capability Set**

JTRS

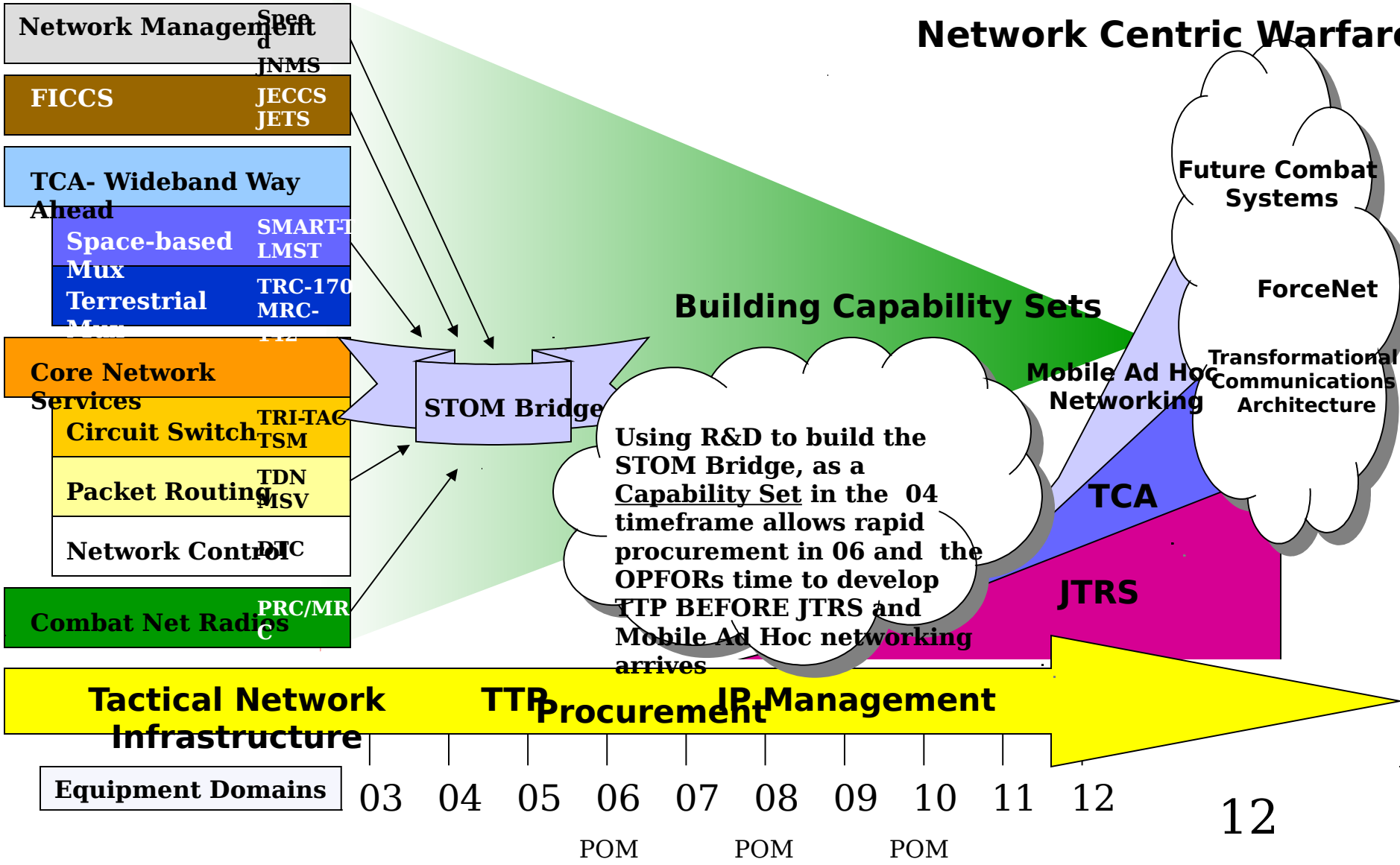
The MSC Net becomes the TCA.

PoP-V are built Using JTRS Cluster 1 Vehicles

The MEC Net becomes J

The USMC To-Be Architecture

Strategic Vision



Conclusions

- ***The Marine Corps C4 Architecture is in a Transformational Period, but there is only limited funding available to the maneuver elements until after FY2010***

- ***Current experimentation demonstrates we can bridge the "Digital Divide" between the Maneuver Elements and their MSCs by enabling digital access to the data from the bottom up.***

- ***POM-06 enables the Marine Corps to use JTRS, FICCS, and STOM Bridge to enable the Transformation Plan.***

Questions